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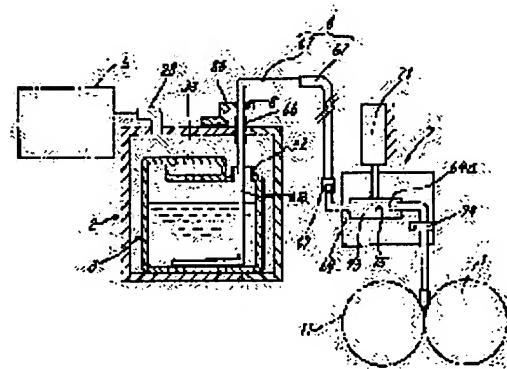
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### (54) APPARATUS FOR FEED AND RECOVERY OF LIQUID

#### (57)Abstract:

PROBLEM TO BE SOLVED: To shorten the recovery time for printing ink.

SOLUTION: This apparatus for feed and recovery of liquid is composed of a sealed pressure vessel 2, a pressurizing or pressure reducing device 5 connected to the sealed pressure vessel 2, a liquid tank 3 exchangeably housed in the sealed pressure vessel 2, and a pipe line 6 wherein it passes airtightly through the sealed pressure vessel 2, one end penetrates in the liquid tank 3 and extends to a bottom of the liquid 3, and the other end is composed of the air. Then, the pressurizing or pressure reducing device 5 uses a common compressor 42, and feeds a high speed air flow from the compressor to the sealed pressure vessel 2 to make ink in the ink tank 3 flow out from a nozzle 64 by raising pressure inside the sealed pressure vessel 2 and inside the liquid tank 3 to higher pressure than atmospheric pressure in feeding the liquid. In recovering ink, an orifice effect is generated by high speed air from the compressor, air in the sealed pressure vessel 2 is sucked to make the inside of the sealed pressure vessel 2 and the inside of the liquid tank 3 negative in pressure, and the liquid is recovered by suction into the liquid tank 3 from the nozzle 64.



speed air from the compressor, air in the sealed pressure vessel 2 is sucked to make the inside of the sealed pressure vessel 2 and the inside of the liquid tank 3 negative in pressure, and the liquid is recovered by suction into the liquid tank 3 from the nozzle 64.

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## CLAIMS

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[Claim(s)]

[Claim 1] The pressurization and the decompression device (5) which were connected to the shut-in pressure container (2) and this shut-in pressure container (2), The liquid tank held exchangeable in a shut-in pressure container (2) (3), Penetrate a shut-in pressure container (2) airtightly, and an end invades in a liquid tank (3) and is prolonged to the bottom of a liquid tank (3). The other end is constituted by the duct (6) wide opened by atmospheric air. A shut-in pressure container (2) It is formed with the lid (22) which closes airtightly the effective area of the body of a container (21), and this body of a container (21). The duct insertion hole (20) which inserts in said duct (6) airtightly straddles the body of a container (21), and a lid (22). It is established so that a core may be located in the boundary of the body of a container (21), and a lid (22). a hole -- pressurization and a decompression device (5) Use a compressor and the high-speed airstream from a compressor is supplied to a shut-in pressure container (2) at the time of liquid supply. Raise the interior of a shut-in pressure container (2) and a liquid tank (3) rather than an open air pressure, and the liquid in a liquid tank (3) is made to flow out of a nozzle (64). At the time of liquid recovery The air in a shut-in pressure container (2) is attracted by the suction effect which is made to pass an ejector (406) and produces the high-speed air from a compressor with this ejector (406). The liquid supply and the recovery system which are

characterized by making the interior of a shut-in pressure container (2) and a liquid tank (3) into negative pressure, and carrying out suction recovery of the liquid into a liquid tank (3) from a nozzle (64).

[Claim 2] The pressurization and the decompression device (5) which were connected to the shut-in pressure container (2) and this shut-in pressure container (2), The liquid tank held exchangeable in a shut-in pressure container (2) (3), Penetrate a shut-in pressure container (2) airtightly, and an end invades in a liquid tank (3) and is prolonged to the bottom of a liquid tank (3). The other end is constituted by the duct (6) wide opened by atmospheric air. A pressurizer (4) and a decompression device (5) Use a compressor and the high-speed airstream from a compressor is supplied to a shut-in pressure container (2) at the time of liquid supply. Raise the interior of a shut-in pressure container (2) and a liquid tank (3) rather than an open air pressure, and the liquid in a liquid tank (3) is made to flow out of a nozzle (64). At the time of liquid recovery The air in a shut-in pressure container (2) is attracted by the suction effect which is made to pass an ejector (406) and produces the high-speed air from a compressor with this ejector (406). The liquid supply and the recovery system which are characterized by making the interior of a shut-in pressure container (2) and a liquid tank (3) into negative pressure, and carrying out suction recovery of the liquid into a liquid tank (3) from a nozzle (64).

[Claim 3] Pressurization and a decompression device (5) are the liquid supply according to claim 1 or 2 and the recovery system which are one set (42) of a compressor and perform pressurization and reduced pressure.

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[Field of the Invention] supply and recovery of ink -- carrying out -- facilities -- it is related with supply and the recovery system of a liquid. [ in / in this invention / the printing machine of a corrugated paper sheet ]

[0002]

[Description of the Prior Art] As a printing machine of a corrugated paper sheet, the printing machine of the middle type of the flexographic press which uses quick drying ink (flexo ink), and the PURISURO printing machine which uses slow-drying ink is carried out recently. this printing machine is shown in drawing 9 -- as -- a printing cylinder (12) -- receiving -- contact -- it is arranged possible [ alienation ] and constituted by the main roll (1) in which detailed irregularity was formed on the front face, the auxiliary roll (11) which countered this main roll (1) and carried out contact disposition, and supply and the recovery system (100) of ink. Viscosity of ink is somewhat higher than flexo ink, when having adhered on a roll, and it is hard to dry and it adheres to the corrugated paper sheet S, it is ink (for example, ZAN cup made from \*\*\*\* Co. # 4 10 - 13 seconds) of a property dried promptly, and what is dried in about 10 seconds is used for it.

[0003] The crevice where the main roll (1) front face is detailed is covered with the ink supplied to ink \*\*\*\*\* during a roll, and it is received and passed to a printing cylinder (12). Moreover, an overall length is covered in the front face of the main roll (1) which excessive ink was scratched and passed the point of contact with an auxiliary roll (11) with an auxiliary roll (11), and ink adheres to abbreviation homogeneity. Therefore, in the heights of the printing cylinder which ink receives from this main roll (1), and is passed, ink adheres to homogeneity

and the problem of the ink spots at the time of being printing, a color deflection, a ghost, etc. is not produced. Moreover, compared with printing by conventional flexo ink, ink with high viscosity is used for a while, and beautiful printing which has gloss in a printing side can be realized. Moreover, since it is not necessary like [ in the case of flexo ink ] to circulate ink in a circulation duct in order to prevent solidification of ink, the same equipment (100) can perform supply and recovery of ink using the tube pump (101) which can simplify the equipment for supply of ink, and recovery, for example, is shown in drawing 9, drawing 10, and drawing 11 R>1.

[0004] Supply and the recovery system (100) of the above-mentioned ink arrange susceptor (9) above a roll (1) and (11) possible [ the slide to the shaft orientations of a roll, and parallel ], and coordinate this susceptor (9) with a slide driving gear (95). The nozzle susceptor which is coordinated with a tube pump (101) and a pneumatic cylinder (71) at a susceptor (9) top, and goes up and down (72), The flexible tube (103) which connects an ink tank (3) and a nozzle (64) via the nozzle (64) and ink tank (3) by which it was laid in this nozzle susceptor (72), and the tip was crooked downward towards between a roll (1) and (11), and a tube pump (101) is arranged. By Rota (101b), a tube pump (101) extrudes a tube intermittently, feeds ink, and can switch the feeding direction on the contrary by forward [ of a motor (102) ], and the change of inverse rotation so that it may be well-known. Moving susceptor (9) to the shaft orientations of a roll (1) and (11), and parallel, Rota (101b) of a tube pump (101) is rotated in the forward direction, and ink is supplied between rolls.

[0005] Dropping nozzle susceptor (72), making the lower limit of a nozzle (64) approach the bottom of ink \*\*\*\*\* during a roll, and making susceptor (9) slide to the shaft orientations of a roll, and parallel in this condition by the pneumatic cylinder (71), recovery of ink reverses Rota (101b) of a tube pump (101), and collects ink on an ink tank (3). In the case of an ink substitute, a flexible tube (103) is removed from a tube pump (101), and it exchanges an ink tank (3), a flexible tube (103), and a nozzle (64) together as one set.

[0006]

[Problem(s) to be Solved by the Invention] Ink supply and the recovery system of the above-mentioned tube pump type require time and effort, in order to set a flexible tube (103) to a tube pump (101). Although the set of the flexible tube to a tube pump (101) removes the top cover (101a) of a tube pump (101) and a flexible tube (103) is inserted in in the condition of having been crooked in the shape of U character so that Rota (101b) might be exchanged, the tube pump (101) is attached in the about [ 1.7m ] height location on the structure of a printing machine, and serves as an activity while looking up at a tube pump (101), and its workability is bad.

[0007] Moreover, in order to extrude a flexible tube (103) in Rota (101b), the flexible tube (103) is formed with the soft ingredient. As shown in drawing 11, when dropping nozzle susceptor (72) in the case of ink recovery, between a tube pump (101) and the end face (64b) of a nozzle (64), a flexible tube (103) is crooked in the shape of V character (103a), it is interfered with passage of ink, and suction capacity declines sharply. Therefore, for ink recovery, the shaft orientations of a roller must be made to go and come back to a nozzle (64) repeatedly, and recovery takes time amount. If it will be in the condition that crookedness (103a) broke completely and bent, most suction capacity will be lost. Also in case the crookedness phenomenon of the shape of V character of this flexible tube (103) sets a flexible tube (103) to Rota (101b), it is what often happens and the set of a flexible tube (103) must be performed carefully.

[0008] Between an ink tank (3) and a tube pump (101), when a tube is crooked in the shape of

V character, the capacity of ink supply declines extremely. Since completion of ink recovery or supply is slow, an operator is going to notice the knee of a tube, a hand tends to be lengthened from the upper part of equipment, with equipment not suspended, it is going to correct the knee of a tube, and accident has been caused. Moreover, as a property of a tube pump, if air mixes with a flexible tube (103), feeding capacity will decline. Even if it drops the lower limit of a nozzle to the bottom of ink \*\*\*\*\* between rollers, if the amount of ink becomes less, air will surely mix from the tip of a nozzle and the capacity fall of a tube pump (101) will not be avoided.

[0009] Furthermore, use of a tube pump (101) does not avoid that a tube becomes long only in the part which bends a tube in order to make it go via Rota (101b) at least. Therefore, the amount of ink which adheres in a tube and becomes useless also increases, and washing of a tube also requires time and effort. Furthermore, when a tube becomes long, the rise time after a tube pump (101) operates until ink is actually supplied between rolls, or the rise time until sucking recovery of ink is started starts for a long time, and it is inefficient. The trouble of the above-mentioned tube pump is canceled, the recovery time amount of ink can be shortened, an ink substitute is easy, and can lessen futility of ink as much as possible, and this invention clarifies the liquid supply and the recovery system which can be carried out to supply and recovery of liquids other than ink.

[0010]

[Means for Solving the Problem] The pressurization and the decompression device (5) by which the liquid supply and the recovery system concerning this invention were connected to the shut-in pressure container (2) and this shut-in pressure container (2), The liquid tank held exchangeable in a shut-in pressure container (2) (3), Penetrate a shut-in pressure container (2) airtightly, and an end invades in a liquid tank (3) and is prolonged to the bottom of a liquid tank (3). The other end is constituted by the duct (6) wide opened by atmospheric air. A pressurizer (4) and a decompression device (5) Use a compressor and the high-speed airstream from a compressor is supplied to a shut-in pressure container (2) at the time of liquid supply. Raise the interior of a shut-in pressure container (2) and a liquid tank (3) rather than an open air pressure, and the liquid in a liquid tank (3) is made to flow out of a nozzle (64). At the time of liquid recovery The air in a shut-in pressure container (2) is attracted by the suction effect which is made to pass an ejector (406) and produces the high-speed air from a compressor with this ejector (406). The interior of a shut-in pressure container (2) and a liquid tank (3) is made into negative pressure, and suction recovery of the liquid is carried out into a liquid tank (3) from a nozzle (64).

[0011]

[Function and Effect] In order not to use a tube pump like the former in this invention, there is no troublesomeness which sets a flexible tube to a pump for every ink substitute. moreover, the amount of ink which the die length of the duct (6) which connects an ink tank (3) and a nozzle (64) can be shortened, adheres in a duct (6), and becomes useless in order not to use a tube pump -- few -- it can do -- moreover, washing of a duct (6) -- base -- it can do quickly. Moreover, since the interior of a shut-in pressure container (2) and an ink tank (3) is pressurized or decompressed by high-speed airstream and supply and recovery of ink are performed, compared with the thing using the conventional tube pump (101), the amount of ink feeding per the rise time of ink supply or recovery and unit time amount is made into size, and the time amount of ink supply and recovery can be shortened.

[0012] Even if it uses a flexible hose (62) for the duct (6) between an ink tank (3) and a nozzle (64), moreover, this hose In extent with which a nozzle (64) moves up and down, the hard thing

which is not crooked in the shape of V character can be used, an elastic tube is crooked in the shape of V character like [ in the case of using a tube pump ], and feeding capacity of a pump is not reduced sharply. Adjustment of the welding pressure to a shut-in pressure container (2) and a suction force can adjust supply of ink, and recovery capacity freely. Moreover, even if air enters from a nozzle (64) tip, like [ at the time of sucking up ink at once together with air, and the sucking force of ink not declining sharply, and using a tube pump ], air enters and sucks up in a tube, capacity declines, and this thing does not have recovery time amount for a long time. pressurization and a decompression device (5) can also perform pressurization and reduced pressure by one set (42) of a compressor, and its configuration is simple in this case -- reduction of cost -- \*\*\*\* -- things are made.

[0013]

[The gestalt 1 of implementation of invention] As shown in drawing 1, a base plate (93) is arranged above the main roll (1) and an auxiliary roll (11) possible [ the slide to the shaft orientations of a roll, and parallel ]. the former shown in drawing 9 -- the same -- carrying out - - the main roll (1) -- a printing cylinder (12) -- receiving -- contact -- it is arranged possible [ alienation ] and detailed irregularity is formed in a front face. an auxiliary roll (11) -- a front face -- the product made of rubber -- it is -- this main roll (1) -- countering -- contact -- it is arranged possible [ alienation ] and possible [ pressurization ]. The base plate (93) engaged two or more guide idlers (94) with the guide frame (300) possible [ rolling ], and is connected with the circumference chain (96) arranged along with this guide flume. A circumference chain (96) is coordinated with a drive sprocket (not shown), and constitutes the slide driving gear (95) of a base plate (93). The shut-in pressure container (2) which holds an ink tank (3) is hung and supported to the above-mentioned base plate (93).

[0014] Although it is the magnitude in which a shut-in pressure container (2) fully has allowances to an ink tank (3) in drawing 2 in order to give explanation intelligible, in practice, it is the range an ink tank (3) can be taken in and out of which, and it can shorten the time amount which makes the inside of a shut-in pressure container (2) high pressure or negative pressure, and a shut-in pressure container (2) is so desirable that it is as much as possible small. shut-in pressure containers (2) are 2 rate structures which consist of a body of a container (21) in which one side face carried out opening, and a lid (22) boiled and attached so that this effective area might be closed, as shown in drawing 3. A rectangle frame-like sealant (29) separates and twists to either of the contact sides of the body of a container (21), and a lid (22), or both sides by adhesion etc., and they are equipped with it like. A lid (22) is attached in the body of a container (21) possible [ closing motion ] on a hinge (23), and a lid (22) is closed with a stop means (26) by the body of a container (21) at a sealing condition.

[0015] An example of a stop means (26) is explained based on drawing 3. L type metallic ornaments (500) (500) protrude on the location which counters them on the outside of a shut-in pressure container (2) when a lid (22) is closed on the free end and the body of a container (21) of a lid (22). As for L mold each metallic ornaments (500) (500), Itabe's (501) field counters the field of one Itabe (501) of partner L type metallic ornaments (500) mutually [ while ]. The tip outside of Itabe (501) (501) who counters is cut aslant, and the inclination slideway (501a) (501a) is formed.

[0016] A lever (502) is supported pivotably by either the body of a container (21), or the lid (22) rotatable in a vertical plane under the L type metallic ornaments (500) (502a), and the clip member (503) which sandwiches Itabe (501) (501) who counters this lever (502) mutually [ the L type metallic ornaments (500) (500) of the body of a container (21) and a lid (22) ] is being fixed to it. It inserts into an L type metallic-ornaments (500) side, and a slot (504) is

established, the opening edge of a clip slot (504) is aslant cut by the clip member (503), and the inclination slideway (504a) (504a) is formed in it. As for the clip slot (504), the flute width is decided so that Itabe (501) (501) whom L type metallic ornaments (500) (500) counter may fit in closely. Although it inserted into the lever (502) which supported the end pivotably and the member (503) is attached in the example, if a clip member (503) can be moved so that Itabe (501) (501) can be engaged and released from an outside, the configuration of the migration means of a clip member (503) will not be asked.

[0017] If a lid (22) is closed, a sealant (29) will be pressed between the body of a container (21), and a lid (22). A lever (502) is pushed up and Itabe (501) (501) is made to trespass upon the clip slot (504) of a clip member (503), after Itabe (501) (501) of L type metallic ornaments (500) (500) has countered. Engagement of a clip member (503) and Itabe (501) (501) does not take the big force by Itabe's (501) (501) inclination slideway (501a) (501a), and the inclination slideway (504a) (504a) of a clip member (503). According to the elastic return force of a sealant (29), the airtight of the body of a container (21) and a lid (22) is certainly secured. In addition, of course, the lever (502) containing a clip member (503) may be attached in a lid (22). The circular hole (20) is established ranging over the top plate of the body of a container (21), and a lid (22), the core of this hole (20) will be located in the boundary line of the body of a container (21), and a lid (22), and a semicircle-like notch (20a) (20a) will be established by the body of a container (21), and the lid (22). The above-mentioned hole (20) is a duct insertion hole for letting the duct (6) which connects an ink tank (3) and said nozzle (64) pass.

[0018] The transparence inspection hole (27) airtightly covered with the transparence plate is prepared in the side face of the body of a container (21). This transparence inspection hole (27) is for viewing and getting to know the residue of the ink of the ink tank (3) in a shut-in pressure container (2). Corresponding to the location of a semicircle-like notch (20a), the duct supporter (86) is formed in the head-lining side of the body of a container (21). A supporter (86) has the anchoring leg (88) short downward in a end face, and as shown in drawing 5 A and B, it has the U character-like notch (87) which carries out opening to a tip side. The width of face of a U character-like notch (87) is small size from the diameter of the brass pipe (61) of the after-mentioned duct (6). The \*\*\*\*\* implement (8) which \*\*\*\*\* the brass pipe (61) which fitted into the U character-like notch (87) is arranged by the supporter (86).

[0019] It penetrates from the lateral surface of a supporter (86) to a U character-like notch (87), and a \*\*\*\*\* implement (8) screws a tubed screw case (81), it fixes with a nut (85), and arranges the piece of a stop (82) possible [ frequent appearance ] at the inner edge of this case, screws a stop screw (84) in a case outer edge, and arranges a compression spring (83) between a stop screw (84) and the piece of a stop (82). When a brass pipe (61) reaches the back end of a U character-like notch (87), the amount of point projects the piece of a stop (82) from a case, and it holds the posture of a brass pipe (61) in the side face of a brass pipe (61). If a brass pipe (61) is pulled to the opening side of a U character-like notch (87), the piece of a stop (82) can resist a spring (83), can withdraw in a case (81), and can extricate a brass pipe (61) from a supporter (86). Also in case a brass pipe (61) is inserted in in the inner part of a U character-like notch (87), the piece of a stop (82) draws similarly and it is convenient.

[0020] Toward a lid (22) side, as for a supporter (86), opening of a U character-like notch (87) is attached in the body of a container (21) so that the back end of a U character-like notch (87) may be located in small lid (22) approach from right above the radii edge of the semicircle-like notch (20a) of the body of a container (21). The reason for having made the U character-like notch (87) into the small lid (22) side approach is for supporting a brass pipe (61) perpendicularly in consideration of the thickness of the sealant (66) in which a brass pipe (61)

carries out a postscript. Susceptor (91) was arranged on the side face of the body of a container (21) of a shut-in pressure container (2), nozzle susceptor (72) was prepared possible [ rise and fall ] on this susceptor, and the lifting device (7) is coordinated with this nozzle susceptor (72). A lifting device (7) is a pneumatic cylinder (71).

[0021] Nozzle susceptor (72) has the wall surface crooked in the shape of L character in the vertical plane, has the longwise wall surface prolonged downward from the end of an oblong wall surface and this wall surface, and protrudes the piece of a nozzle support (73), and (74) on both wall surfaces. An oblong slot (75) protrudes on the upper piece of a support (73), and the notching-like slot (76) is established by the downward piece of a support (74). When a nozzle (64) is carried ranging over each piece of a support (73), the \*\*\*\*\* implement (not shown) which \*\*\*\*\* a nozzle (64) is formed in each piece of a support (73), and (74). The structure of a \*\*\*\*\* implement is the same structure as the \*\*\*\*\* implement (8) which suited explanation of a shut-in pressure container (2).

[0022] In the vertical plane, a nozzle (64) is crooked in the shape of L character, and the brass pipe is formed. The horizontal level (64a) of a nozzle (64) is inserted in the slot (75) of said upper piece of a support (73), the vertical section (64b) of a nozzle (64) is inserted in the slot (74) of the downward piece of a support (74), and it is supporting dismountable with the \*\*\*\*\* implement. In the example, the nozzle point section (65) which cut the synthetic-resin pipe at the tip of a nozzle (64) short, and formed it in it is attached. reverse V character-like notching (65a) gives the nozzle point section (65) at a tip -- having -- this notching (65a) -- the through tube (65b) is established up for a while. Reverse V character-like notching (65a) is to make the nozzle point section (65) easy to transform along the curved surface of a roll (1) and (11), when a nozzle (64) descends to the bottom of ink \*\*\*\*\* between a roll (1) and (11). A through tube (65b) constitutes the role which prevents that a suction force is too strong, the nozzle point section (65) is crushed flatly and ink suction falls extremely at the time of ink recovery.

[0023] An ink tank (3) is connected with the above-mentioned nozzle (64) in a duct (6). Like drawing 2, in the example, as for an ink tank (3), the ink manufacturer assumes the tank which puts in and sells ink, and the handle (33) is prepared in the end side on top at the opening (32) and other end side. The duct (6) of an example connects a flexible hose (62) to the brass pipe (61) inserted in an ink tank (3), and is formed, and the upper limit of the longwise true straight part (61a) is crooked mutually [ a lower limit ] by this pipe (61) at the abbreviation right angle at the nozzle (64) side in the direction which keeps away from opening (32) of an ink tank (3).

[0024] A brass pipe (61) is inserted in the condition that allowances are in opening (32) of an ink tank (3) to the base of a tank, and a nozzle (64) is connected with a flexible hose (62) removable through the desorption joint for fluids (67). The socket which attached the desorption joint for fluids (67) at the tip of a flexible hose (62) like drawing 1 R> 1 (67a), It is constituted by the plug (67b) attached in the end face of a nozzle (64). If the automatic closing motion bulb (not shown) is built in the socket (67a) and a plug (67b) is fitted into a socket (67a), this bulb will open automatically, and if a plug (67b) is removed, a bulb will close automatically. A flexible hose (62) chooses the thing of the hardness which is not crooked in the shape of V character in extent which a nozzle (64) goes up and down by the pneumatic cylinder (71). Moreover, the sealant (66) of a \*\*\* sake is equipped with the airtight with the duct insertion hole (20) of said shut-in pressure container (2) by the longwise true straight part (61a) of a brass pipe (61). The sealant (66) of an example is cutting the elastic pipe made of synthetic resin short, and inserts it in a brass pipe (61).

[0025] An end connection (28) is prepared in head lining of said body of a container (21), and

as shown in drawing 2, the pressurization by which it is characterized [ of this invention ], and a decompression device (5) are coordinated with this end connection (28). The pressurization of an example and a decompression device (5) can pressurize and decompress the interior of a shut-in pressure container (2) by one compressor (42). From a compressor (42), it branches and the 1st and 2nd passage (400a) (400b) is formed. The 1st passage (400a) is branched and connected with a shut-in pressure container (2), and joins the 2nd passage (400b) through an ejector (vacuum generator) (406). An ejector (406) is a well-known thing which the 1st passage (400a) side is attracted [ thing ] and generates a vacuum by feeding the compressed air into this ejector from the 2nd passage (400b). From the above-mentioned ejector (406), the 3rd passage (400c) extends on extension of the 2nd passage (400b), and it is wide opened by atmospheric air through the silencer (407).

[0026] The change-over valve (408) is prepared in the 1st passage (400a) sequentially from the upstream at the change-over valve (401), reducing-valve (402), change-over valve (403), and ejector (406) side between the tee (400d) to a shut-in pressure container (2), and the compressor (42). The upstream and a downstream change-over valve (401) (408) are solenoid valves which can be switched to open and close, and a middle change-over valve (403) is a solenoid valve which can be switched to open, close, and atmospheric-air disconnection. An open and close change-over valve (404) is prepared in the upstream, and the reducing valve (405) is prepared in the 2nd passage (400b) at the downstream.

[0027] At the time of the pressurization to a shut-in pressure container (2), the change-over valve (408) of the downstream of the 1st passage (400a) and the change-over valve (404) of the 2nd passage (400b) are closed, and it opens the upstream and the middle change-over valve (401) (403) of the 1st passage (400a). As an arrow head A shows, the high-speed airstream from a compressor (42) flows in a shut-in pressure container (2) through a reducing valve (402), and pressurizes the inside of a shut-in pressure container (2). At the time of reduced pressure, the change-over valve (408) of the downstream of the 1st passage (400a) and the change-over valve (404) of the 2nd passage (400b) are opened, and it closes the upstream and the middle change-over valve (401) (403) of the 1st passage (400a). As an arrow head B shows the high-speed air from a compressor (42), it flows from the 2nd passage (400b) to the 3rd passage (400c) and an arrow head C shows, the flow of the air from a shut-in pressure container (2) side to the 3rd passage (400c) arises, and the inside of a shut-in pressure container (2) serves as negative pressure. In case high-speed airstream is emitted to atmospheric air from the 3rd path (400c), in order to pass a silencer (407), an air emission sound becomes low and does not emit the noise.

[0028] If ink supply forms an oil-level detector in ink \*\*\*\*\* between the main roll (1) and an auxiliary roll (11) and the amount of ink becomes below the minimum set point, an ink supply signal will be emitted automatically, the above-mentioned pressurization and a decompression device (5) will be switched to a pressurization side, and ink supply will be made. If ink reaches the upper limit set point, a compressor (42) will stop and ink supply will stop. Recovery of ink will be automatically performed by the signal from a control unit (not shown), if actuation of a manual carbon button (not shown) or printing of the specified quantity is completed.

[0029] Very, the lid (22) of a shut-in pressure container (2) is opened, and an ink tank (3) is inserted in the body of a container (21). The duct (6) is beforehand attached in the ink tank (3). That is, the brass pipe (61) is inserted in opening (32) of an ink tank (3). In case an ink tank (3) is inserted in the body of a container (21), the upper part of a brass pipe (61) is pushed in to the back of the U character-like notch (87) of a supporter (86), and a sealant (66) is inserted in the semicircle-like notch (20a) of the body of a container (21). Like the above, a brass pipe (61) is

automatically supported by the perpendicular posture with a supporter (86). A lid (22) is closed and it stops with a stop means (26). The socket (67a) of a flexible hose (62) is inserted in the plug (67b) of the nozzle (64) beforehand set to the nozzle susceptor (72) on a shut-in pressure container (2).

[0030] Like the above, at the time of ink supply, pressurization and a decompression device (5) are switched to a pressurization side, and it is operated. The high-speed airstream from a compressor (42) fills the interior of a shut-in pressure container (2) for a short time to high pressure, and makes the ink in an ink tank (3) flow out of a nozzle (64). The shaft orientations of a roll and parallel are made to move susceptor (9) to coincidence, and ink is supplied along with ink \*\*\*\*\* between a roll (1) and (11). By adjustment of a reducing valve (402), the flow of the ink from a nozzle (64) can be set up freely.

[0031] At the time of ink recovery, a nozzle (64) is dropped until it approaches the bottom of ink \*\*\*\*\* during a roll, and it switches a change-over valve (45) to a suction pump (52) side. Pressurization and a decompression device (5) are switched to a suction side, and it operates. This nozzle (64) is moved to the shaft orientations of a roll, and parallel. By the suction effect by the high-speed airstream which passes an ejector (406), the inside of a shut-in pressure container (2) also serves as negative pressure for a short time, and carries out suction recovery of the ink of ink \*\*\*\*\* into an ink tank (3) from a nozzle (64).

[0032] In the case of an ink substitute, engagement of the plug (67b) of a nozzle (64) and the socket (67a) of a flexible hose (62) is removed. The automatic closing motion bulb is built in the socket (67a), if a plug (67b) is removed, in order that opening may close automatically, the ink in a flexible hose (62) hangs down and falls, and a perimeter is not soiled. What is necessary is to open the lid (22) of a shut-in pressure container (2), to take out a duct (6) every ink tank (3), to hold a new ink tank in a shut-in pressure container (2), and just to set a duct together with this ink tank in the above mentioned procedure.

[0033] In order not to use a tube pump like the former in this invention, there is no troublesomeness which sets a flexible tube to a pump for every ink substitute. Even if it uses a flexible hose (62) for the duct (6) between an ink tank (3) and a nozzle (64), moreover, this hose In extent with which a nozzle (64) moves up and down, the hard thing which is not crooked in the shape of V character can be used, a tube is crooked in the shape of V character by descent of a nozzle (64) like [ at the time of using a tube pump ], and feeding capacity of a pump is not reduced sharply.

[0034] Since the foaming location is far from opening (32) even if it involves in air in the case of ink recovery and the inside of an ink tank (3) foams at it if it is crooked so that the lower limit of the brass pipe (61) inserted in the ink tank (3) may be kept away from opening (32) of an ink tank (3) like an example, ink blows and does not fall.

[0035] Adjustment of the welding pressure to a shut-in pressure container (2) and a suction force can adjust supply of ink, and recovery capacity freely. Moreover, even if air enters from a nozzle (64) tip, like [ at the time of the sucking force of ink not declining sharply and using a tube pump ], air enters and sucks up in a tube, capacity declines, and this thing does not have recovery time amount for a long time.

[0036] A compressor (42) is suspended when ink arrives at a setting upper limit location at the time of ink supply. A change-over valve (403) in addition, only by closing Although high pressure remains in the shut-in pressure container (2) and a certain amount of ink outflow is not avoided from a nozzle (64), by the change-over valve (403) By opening the 1st passage (400a) for free passage to atmospheric air, the inside of a shut-in pressure container (2) serves as atmospheric pressure in an instant, and the outflow of the ink from a nozzle (64) stops.

[0037]

[Example] The rise time was about 3 seconds setting a reducing valve (43) to 0.3 kgf/cm<sup>2</sup>, and supplying 800 cc ink. It was about 60 seconds from a standup to the completion of supply. The time amount which 800 cc ink recovery took was about 60 seconds. The degree of vacuum at this time was 450mmHg. The rise time was about 3 seconds. It is the rise time for supplying 800 cc ink with the conventional tube pump. It was about 5 seconds. It was about 65 seconds from a standup to the completion of supply. The time amount which 800 cc ink recovery took was about 100 seconds. The rise time was 5 seconds. However, this is the case where the tube of a tube pump is not crooked in the shape of V character, and if between a tube pump (101) and ink tanks (3) is crooked in the shape of V character, most capacity of ink supply will be lost. If a tube is crooked in the shape of V character between a tube pump (101) and a nozzle (64), most ink recovery capacity will be lost. The above-mentioned data are a comparison with the printing machine of our company.

[0038] Drawing 7 and drawing 8 are deformation of the stop means (26) of the body of a container (21) of a shut-in pressure container (2) and a lid (22). The L type metallic ornaments (500) by the side of the body of a container (21) are omitted, Itabe (501) of the L type metallic ornaments (500) by the side of a lid (22) can be scratched to the lock member (508) on the lever (502) supported pivotably on the body of a container (21) (502a), and a lid (22) is locked. The inclination slideway (504a) (501a) for making engagement easy is formed in a lock member (508) and Itabe (501). Since L type metallic ornaments (500) can be managed with one, a configuration becomes easy. It is a body (21) side of a container about L type metallic ornaments (500). Even if it prepares a lever (502) and a lock member (508) in a lid (22) side, the same operation and effectiveness as the above are done so.

[0039] This invention of the ability to carry out to supply of liquids other than ink and a recovery system is natural. Moreover, if it is made to perform supply and recovery of a liquid as the tip of a nozzle (64) is soaked in the tank for liquid supply, rise-and-fall movement of a nozzle (64) is not necessarily required. Moreover, if the tip of a duct (6) is directly soaked in a tank, the nozzle (64) itself is omissible. Furthermore, two sets of compressors, a \*\* and the object for suction, are prepared in pressurization and a decompression device (5) at the time of pressurization, and, of course, a separate compressor can be operated at the time of pressurization and reduced pressure. Deformation various in the range given in a claim is possible for this invention, without being limited to the configuration of the above-mentioned example.

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## TECHNICAL FIELD

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[Field of the Invention] supply and recovery of ink -- carrying out -- facilities -- it is related with supply and the recovery system of a liquid. [ in / in this invention / the printing machine of a corrugated paper sheet ]

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## EFFECT OF THE INVENTION

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[Function and Effect] In order not to use a tube pump like the former in this invention, there is no troublesomeness which sets a flexible tube to a pump for every ink substitute. moreover, the amount of ink which the die length of the duct (6) which connects an ink tank (3) and a nozzle (64) can be shortened, adheres in a duct (6), and becomes useless in order not to use a tube pump -- few -- it can do -- moreover, washing of a duct (6) -- base -- it can do quickly.

Moreover, since the interior of a shut-in pressure container (2) and an ink tank (3) is pressurized or decompressed by high-speed airstream and supply and recovery of ink are performed, compared with the thing using the conventional tube pump (101), the amount of ink feeding per the rise time of ink supply or recovery and unit time amount is made into size, and the time amount of ink supply and recovery can be shortened.

[0012] Even if it uses a flexible hose (62) for the duct (6) between an ink tank (3) and a nozzle (64), moreover, this hose In extent with which a nozzle (64) moves up and down, the hard thing which is not crooked in the shape of V character can be used, an elastic tube is crooked in the shape of V character like [ in the case of using a tube pump ], and feeding capacity of a pump is not reduced sharply. Adjustment of the welding pressure to a shut-in pressure container (2) and a suction force can adjust supply of ink, and recovery capacity freely. Moreover, even if air enters from a nozzle (64) tip, like [ at the time of sucking up ink at once together with air, and the sucking force of ink not declining sharply, and using a tube pump ], air enters and sucks up in a tube, capacity declines, and this thing does not have recovery time amount for a long time. pressurization and a decompression device (5) can also perform pressurization and reduced pressure by one set (42) of a compressor, and its configuration is simple in this case -- reduction of cost -- \*\*\*\* -- things are made.

[0013]

[The gestalt 1 of implementation of invention] As shown in drawing 1, a base plate (93) is arranged above the main roll (1) and an auxiliary roll (11) possible [ the slide to the shaft orientations of a roll, and parallel ]. the former shown in drawing 9 -- the same -- carrying out - - the main roll (1) -- a printing cylinder (12) -- receiving -- contact -- it is arranged possible [ alienation ] and detailed irregularity is formed in a front face. an auxiliary roll (11) -- a front face -- the product made of rubber -- it is -- this main roll (1) -- countering -- contact -- it is arranged possible [ alienation ] and possible [ pressurization ]. The base plate (93) engaged two or more guide idlers (94) with the guide frame (300) possible [ rolling ], and is connected with the circumference chain (96) arranged along with this guide flume. A circumference chain (96) is coordinated with a drive sprocket (not shown), and constitutes the slide driving gear (95) of a base plate (93). The shut-in pressure container (2) which holds an ink tank (3) is hung and supported to the above-mentioned base plate (93).

[0014] Although it is the magnitude in which a shut-in pressure container (2) fully has allowances to an ink tank (3) in drawing 2 in order to give explanation intelligible, in practice, it is the range an ink tank (3) can be taken in and out of which, and it can shorten the time amount which makes the inside of a shut-in pressure container (2) high pressure or negative pressure, and a shut-in pressure container (2) is so desirable that it is as much as possible small. shut-in pressure containers (2) are 2 rate structures which consist of a body of a container (21) in which one side face carried out opening, and a lid (22) boiled and attached so that this effective area might be closed, as shown in drawing 3. A rectangle frame-like sealant (29) separates and twists to either of the contact sides of the body of a container (21), and a lid (22), or both sides by adhesion etc., and they are equipped with it like. A lid (22) is attached in the body of a container (21) possible [ closing motion ] on a hinge (23), and a lid (22) is closed with a stop means (26) by the body of a container (21) at a sealing condition.

[0015] An example of a stop means (26) is explained based on drawing 3. L type metallic ornaments (500) (500) protrude on the location which counters them on the outside of a shut-in pressure container (2) when a lid (22) is closed on the free end and the body of a container (21) of a lid (22). As for L mold each metallic ornaments (500) (500), Itabe's (501) field counters the field of one Itabe (501) of partner L type metallic ornaments (500) mutually [ while ]. The

tip outside of Itabe (501) (501) who counters is cut aslant, and the inclination slideway (501a) (501a) is formed.

[0016] A lever (502) is supported pivotably by either the body of a container (21), or the lid (22) rotatable in a vertical plane under the L type metallic ornaments (500) (502a), and the clip member (503) which sandwiches Itabe (501) (501) who counters this lever (502) mutually [ the L type metallic ornaments (500) (500) of the body of a container (21) and a lid (22) ] is being fixed to it. It inserts into an L type metallic-ornaments (500) side, and a slot (504) is established, the opening edge of a clip slot (504) is aslant cut by the clip member (503), and the inclination slideway (504a) (504a) is formed in it. As for the clip slot (504), the flute width is decided so that Itabe (501) (501) whom L type metallic ornaments (500) (500) counter may fit in closely. Although it inserted into the lever (502) which supported the end pivotably and the member (503) is attached in the example, if a clip member (503) can be moved so that Itabe (501) (501) can be engaged and released from an outside, the configuration of the migration means of a clip member (503) will not be asked.

[0017] If a lid (22) is closed, a sealant (29) will be pressed between the body of a container (21), and a lid (22). A lever (502) is pushed up and Itabe (501) (501) is made to trespass upon the clip slot (504) of a clip member (503), after Itabe (501) (501) of L type metallic ornaments (500) (500) has countered. Engagement of a clip member (503) and Itabe (501) (501) does not take the big force by Itabe's (501) (501) inclination slideway (501a) (501a), and the inclination slideway (504a) (504a) of a clip member (503). According to the elastic return force of a sealant (29), the airtight of the body of a container (21) and a lid (22) is certainly secured. In addition, of course, the lever (502) containing a clip member (503) may be attached in a lid (22). The circular hole (20) is established ranging over the top plate of the body of a container (21), and a lid (22), the core of this hole (20) will be located in the boundary line of the body of a container (21), and a lid (22), and a semicircle-like notch (20a) (20a) will be established by the body of a container (21), and the lid (22). The above-mentioned hole (20) is a duct insertion hole for letting the duct (6) which connects an ink tank (3) and said nozzle (64) pass.

[0018] The transparence inspection hole (27) airtightly covered with the transparence plate is prepared in the side face of the body of a container (21). This transparence inspection hole (27) is for viewing and getting to know the residue of the ink of the ink tank (3) in a shut-in pressure container (2). Corresponding to the location of a semicircle-like notch (20a), the duct supporter (86) is formed in the head-lining side of the body of a container (21). A supporter (86) has the anchoring leg (88) short downward in a end face, and as shown in drawing 5 A and B, it has the U character-like notch (87) which carries out opening to a tip side. The width of face of a U character-like notch (87) is small size from the diameter of the brass pipe (61) of the after-mentioned duct (6). The \*\*\*\*\* implement (8) which \*\*\*\*\* the brass pipe (61) which fitted into the U character-like notch (87) is arranged by the supporter (86).

[0019] It penetrates from the lateral surface of a supporter (86) to a U character-like notch (87), and a \*\*\*\*\* implement (8) screws a tubed screw case (81), it fixes with a nut (85), and arranges the piece of a stop (82) possible [ frequent appearance ] at the inner edge of this case, screws a stop screw (84) in a case outer edge, and arranges a compression spring (83) between a stop screw (84) and the piece of a stop (82). When a brass pipe (61) reaches the back end of a U character-like notch (87), the amount of point projects the piece of a stop (82) from a case, and it holds the posture of a brass pipe (61) in the side face of a brass pipe (61). If a brass pipe (61) is pulled to the opening side of a U character-like notch (87), the piece of a stop (82) can resist a spring (83), can withdraw in a case (81), and can extricate a brass pipe (61) from a supporter (86). Also in case a brass pipe (61) is inserted in in the inner part of a U character-

like notch (87), the piece of a stop (82) draws similarly and it is convenient.

[0020] Toward a lid (22) side, as for a supporter (86), opening of a U character-like notch (87) is attached in the body of a container (21) so that the back end of a U character-like notch (87) may be located in small lid (22) approach from right above the radii edge of the semicircle-like notch (20a) of the body of a container (21). The reason for having made the U character-like notch (87) into the small lid (22) side approach is for supporting a brass pipe (61) perpendicularly in consideration of the thickness of the sealant (66) in which a brass pipe (61) carries out a postscript. Susceptor (91) was arranged on the side face of the body of a container (21) of a shut-in pressure container (2), nozzle susceptor (72) was prepared possible [rise and fall] on this susceptor, and the lifting device (7) is coordinated with this nozzle susceptor (72). A lifting device (7) is a pneumatic cylinder (71).

[0021] Nozzle susceptor (72) has the wall surface crooked in the shape of L character in the vertical plane, has the longwise wall surface prolonged downward from the end of an oblong wall surface and this wall surface, and protrudes the piece of a nozzle support (73), and (74) on both wall surfaces. An oblong slot (75) protrudes on the upper piece of a support (73), and the notching-like slot (76) is established by the downward piece of a support (74). When a nozzle (64) is carried ranging over each piece of a support (73), the \*\*\*\*\* implement (not shown) which \*\*\*\*\* a nozzle (64) is formed in each piece of a support (73), and (74). The structure of a \*\*\*\*\* implement is the same structure as the \*\*\*\*\* implement (8) which suited explanation of a shut-in pressure container (2).

[0022] In the vertical plane, a nozzle (64) is crooked in the shape of L character, and the brass pipe is formed. The horizontal level (64a) of a nozzle (64) is inserted in the slot (75) of said upper piece of a support (73), the vertical section (64b) of a nozzle (64) is inserted in the slot (74) of the downward piece of a support (74), and it is supporting dismountable with the \*\*\*\*\* implement. In the example, the nozzle point section (65) which cut the synthetic-resin pipe at the tip of a nozzle (64) short, and formed it in it is attached. reverse V character-like notching (65a) gives the nozzle point section (65) at a tip -- having -- this notching (65a) -- the through tube (65b) is established up for a while. Reverse V character-like notching (65a) is to make the nozzle point section (65) easy to transform along the curved surface of a roll (1) and (11), when a nozzle (64) descends to the bottom of ink \*\*\*\*\* between a roll (1) and (11). A through tube (65b) constitutes the role which prevents that a suction force is too strong, the nozzle point section (65) is crushed flatly and ink suction falls extremely at the time of ink recovery.

[0023] An ink tank (3) is connected with the above-mentioned nozzle (64) in a duct (6). Like drawing 2, in the example, as for an ink tank (3), the ink manufacturer assumes the tank which puts in and sells ink, and the handle (33) is prepared in the end side on top at the opening (32) and other end side. The duct (6) of an example connects a flexible hose (62) to the brass pipe (61) inserted in an ink tank (3), and is formed, and the upper limit of the longwise true straight part (61a) is crooked mutually [a lower limit] by this pipe (61) at the abbreviation right angle at the nozzle (64) side in the direction which keeps away from opening (32) of an ink tank (3).

[0024] A brass pipe (61) is inserted in the condition that allowances are in opening (32) of an ink tank (3) to the base of a tank, and a nozzle (64) is connected with a flexible hose (62) removable through the desorption joint for fluids (67). The socket which attached the desorption joint for fluids (67) at the tip of a flexible hose (62) like drawing 1  $R > 1$  (67a), It is constituted by the plug (67b) attached in the end face of a nozzle (64). If the automatic closing motion bulb (not shown) is built in the socket (67a) and a plug (67b) is fitted into a socket (67a), this bulb will open automatically, and if a plug (67b) is removed, a bulb will close

automatically. A flexible hose (62) chooses the thing of the hardness which is not crooked in the shape of V character in extent which a nozzle (64) goes up and down by the pneumatic cylinder (71). Moreover, the sealant (66) of a \*\*\*\* sake is equipped with the airtight with the duct insertion hole (20) of said shut-in pressure container (2) by the longwise true straight part (61a) of a brass pipe (61). The sealant (66) of an example is cutting the elastic pipe made of synthetic resin short, and inserts it in a brass pipe (61).

[0025] An end connection (28) is prepared in head lining of said body of a container (21), and as shown in drawing 2, the pressurization by which it is characterized [ of this invention ], and a decompression device (5) are coordinated with this end connection (28). The pressurization of an example and a decompression device (5) can pressurize and decompress the interior of a shut-in pressure container (2) by one compressor (42). From a compressor (42), it branches and the 1st and 2nd passage (400a) (400b) is formed. The 1st passage (400a) is branched and connected with a shut-in pressure container (2), and joins the 2nd passage (400b) through an ejector (vacuum generator) (406). An ejector (406) is a well-known thing which the 1st passage (400a) side is attracted [ thing ] and generates a vacuum by feeding the compressed air into this ejector from the 2nd passage (400b). From the above-mentioned ejector (406), the 3rd passage (400c) extends on extension of the 2nd passage (400b), and it is wide opened by atmospheric air through the silencer (407).

[0026] The change-over valve (408) is prepared in the 1st passage (400a) sequentially from the upstream at the change-over valve (401), reducing-valve (402), change-over valve (403), and ejector (406) side between the tee (400d) to a shut-in pressure container (2), and the compressor (42). The upstream and a downstream change-over valve (401) (408) are solenoid valves which can be switched to open and close, and a middle change-over valve (403) is a solenoid valve which can be switched to open, close, and atmospheric-air disconnection. An open and close change-over valve (404) is prepared in the upstream, and the reducing valve (405) is prepared in the 2nd passage (400b) at the downstream.

[0027] At the time of the pressurization to a shut-in pressure container (2), the change-over valve (408) of the downstream of the 1st passage (400a) and the change-over valve (404) of the 2nd passage (400b) are closed, and it opens the upstream and the middle change-over valve (401) (403) of the 1st passage (400a). As an arrow head A shows, the high-speed airstream from a compressor (42) flows in a shut-in pressure container (2) through a reducing valve (402), and pressurizes the inside of a shut-in pressure container (2). At the time of reduced pressure, the change-over valve (408) of the downstream of the 1st passage (400a) and the change-over valve (404) of the 2nd passage (400b) are opened, and it closes the upstream and the middle change-over valve (401) (403) of the 1st passage (400a). As an arrow head B shows the high-speed air from a compressor (42), it flows from the 2nd passage (400b) to the 3rd passage (400c) and an arrow head C shows, the flow of the air from a shut-in pressure container (2) side to the 3rd passage (400c) arises, and the inside of a shut-in pressure container (2) serves as negative pressure. In case high-speed airstream is emitted to atmospheric air from the 3rd path (400c), in order to pass a silencer (407), an air emission sound becomes low and does not emit the noise.

[0028] If ink supply forms an oil-level detector in ink \*\*\*\*\* between the main roll (1) and an auxiliary roll (11) and the amount of ink becomes below the minimum set point, an ink supply signal will be emitted automatically, the above-mentioned pressurization and a decompression device (5) will be switched to a pressurization side, and ink supply will be made. If ink reaches the upper limit set point, a compressor (42) will stop and ink supply will stop. Recovery of ink will be automatically performed by the signal from a control unit (not shown), if actuation of a

manual carbon button (not shown) or printing of the specified quantity is completed.

[0029] Very, the lid (22) of a shut-in pressure container (2) is opened, and an ink tank (3) is inserted in the body of a container (21). The duct (6) is beforehand attached in the ink tank (3). That is, the brass pipe (61) is inserted in opening (32) of an ink tank (3). In case an ink tank (3) is inserted in the body of a container (21), the upper part of a brass pipe (61) is pushed in to the back of the U character-like notch (87) of a supporter (86), and a sealant (66) is inserted in the semicircle-like notch (20a) of the body of a container (21). Like the above, a brass pipe (61) is automatically supported by the perpendicular posture with a supporter (86). A lid (22) is closed and it stops with a stop means (26). The socket (67a) of a flexible hose (62) is inserted in the plug (67b) of the nozzle (64) beforehand set to the nozzle susceptor (72) on a shut-in pressure container (2).

[0030] Like the above, at the time of ink supply, pressurization and a decompression device (5) are switched to a pressurization side, and it is operated. The high-speed airstream from a compressor (42) fills the interior of a shut-in pressure container (2) for a short time to high pressure, and makes the ink in an ink tank (3) flow out of a nozzle (64). The shaft orientations of a roll and parallel are made to move susceptor (9) to coincidence, and ink is supplied along with ink \*\*\*\*\* between a roll (1) and (11). By adjustment of a reducing valve (402), the flow of the ink from a nozzle (64) can be set up freely.

[0031] At the time of ink recovery, a nozzle (64) is dropped until it approaches the bottom of ink \*\*\*\*\* during a roll, and it switches a change-over valve (45) to a suction pump (52) side. Pressurization and a decompression device (5) are switched to a suction side, and it operates. This nozzle (64) is moved to the shaft orientations of a roll, and parallel. By the suction effect by the high-speed airstream which passes an ejector (406), the inside of a shut-in pressure container (2) also serves as negative pressure for a short time, and carries out suction recovery of the ink of ink \*\*\*\*\* into an ink tank (3) from a nozzle (64).

[0032] In the case of an ink substitute, engagement of the plug (67b) of a nozzle (64) and the socket (67a) of a flexible hose (62) is removed. The automatic closing motion bulb is built in the socket (67a), if a plug (67b) is removed, in order that opening may close automatically, the ink in a flexible hose (62) hangs down and falls, and a perimeter is not soiled. What is necessary is to open the lid (22) of a shut-in pressure container (2), to take out a duct (6) every ink tank (3), to hold a new ink tank in a shut-in pressure container (2), and just to set a duct together with this ink tank in the above mentioned procedure.

[0033] In order not to use a tube pump like the former in this invention, there is no troublesomeness which sets a flexible tube to a pump for every ink substitute. Even if it uses a flexible hose (62) for the duct (6) between an ink tank (3) and a nozzle (64), moreover, this hose In extent with which a nozzle (64) moves up and down, the hard thing which is not crooked in the shape of V character can be used, a tube is crooked in the shape of V character by descent of a nozzle (64) like [ at the time of using a tube pump ], and feeding capacity of a pump is not reduced sharply.

[0034] Since the foaming location is far from opening (32) even if it involves in air in the case of ink recovery and the inside of an ink tank (3) foams at it if it is crooked so that the lower limit of the brass pipe (61) inserted in the ink tank (3) may be kept away from opening (32) of an ink tank (3) like an example, ink blows and does not fall.

[0035] Adjustment of the welding pressure to a shut-in pressure container (2) and a suction force can adjust supply of ink, and recovery capacity freely. Moreover, even if air enters from a nozzle (64) tip, like [ at the time of the sucking force of ink not declining sharply and using a tube pump ], air enters and sucks up in a tube, capacity declines, and this thing does not have

recovery time amount for a long time.

[0036] A compressor (42) is suspended when ink arrives at a setting upper limit location at the time of ink supply. A change-over valve (403) in addition, only by closing Although high pressure remains in the shut-in pressure container (2) and a certain amount of ink outflow is not avoided from a nozzle (64), by the change-over valve (403) By opening the 1st passage (400a) for free passage to atmospheric air, the inside of a shut-in pressure container (2) serves as atmospheric pressure in an instant, and the outflow of the ink from a nozzle (64) stops.

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## TECHNICAL PROBLEM

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[Description of the Prior Art] As a printing machine of a corrugated paper sheet, the printing machine of the middle type of the flexographic press which uses quick drying ink (flexo ink), and the PURISURO printing machine which uses slow-drying ink is carried out recently. this printing machine is shown in drawing 9 -- as -- a printing cylinder (12) -- receiving -- contact -- it is arranged possible [ alienation ] and constituted by the main roll (1) in which detailed irregularity was formed on the front face, the auxiliary roll (11) which countered this main roll (1) and carried out contact disposition, and supply and the recovery system (100) of ink.

Viscosity of ink is somewhat higher than flexo ink, when having adhered on a roll, and it is hard to dry and it adheres to the corrugated paper sheet S, it is ink (for example, ZAN cup made from \*\*\*\* Co. # 4 10 - 13 seconds) of a property dried promptly, and what is dried in about 10 seconds is used for it.

[0003] The crevice where the main roll (1) front face is detailed is covered with the ink supplied to ink \*\*\*\*\* during a roll, and it is received and passed to a printing cylinder (12). Moreover, an overall length is covered in the front face of the main roll (1) which excessive ink was scratched and passed the point of contact with an auxiliary roll (11) with an auxiliary roll (11), and ink adheres to abbreviation homogeneity. Therefore, in the heights of the printing cylinder which ink receives from this main roll (1), and is passed, ink adheres to homogeneity and the problem of the ink spots at the time of being printing, a color deflection, a ghost, etc. is not produced. Moreover, compared with printing by conventional flexo ink, ink with high viscosity is used for a while, and beautiful printing which has gloss in a printing side can be realized. Moreover, since it is not necessary like [ in the case of flexo ink ] to circulate ink in a circulation duct in order to prevent solidification of ink, the same equipment (100) can perform supply and recovery of ink using the tube pump (101) which can simplify the equipment for supply of ink, and recovery, for example, is shown in drawing 9 , drawing 10 , and drawing 11 R> 1.

[0004] Supply and the recovery system (100) of the above-mentioned ink arrange susceptor (9) above a roll (1) and (11) possible [ the slide to the shaft orientations of a roll, and parallel ], and coordinate this susceptor (9) with a slide driving gear (95). The nozzle susceptor which is coordinated with a tube pump (101) and a pneumatic cylinder (71) at a susceptor (9) top, and goes up and down (72), The flexible tube (103) which connects an ink tank (3) and a nozzle (64) via the nozzle (64) and ink tank (3) by which it was laid in this nozzle susceptor (72), and the tip was crooked downward towards between a roll (1) and (11), and a tube pump (101) is arranged. By Rota (101b), a tube pump (101) extrudes a tube intermittently, feeds ink, and can switch the feeding direction on the contrary by forward [ of a motor (102) ], and the change of inverse rotation so that it may be well-known. Moving susceptor (9) to the shaft orientations of a roll (1) and (11), and parallel, Rota (101b) of a tube pump (101) is rotated in the forward direction, and ink is supplied between rolls.

[0005] Dropping nozzle susceptor (72), making the lower limit of a nozzle (64) approach the bottom of ink \*\*\*\*\* during a roll, and making susceptor (9) slide to the shaft orientations of a roll, and parallel in this condition by the pneumatic cylinder (71), recovery of ink reverses Rota (101b) of a tube pump (101), and collects ink on an ink tank (3). In the case of an ink substitute, a flexible tube (103) is removed from a tube pump (101), and it exchanges an ink tank (3), a flexible tube (103), and a nozzle (64) together as one set.

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## MEANS

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[Means for Solving the Problem] The pressurization and the decompression device (5) by which the liquid supply and the recovery system concerning this invention were connected to the shut-in pressure container (2) and this shut-in pressure container (2), The liquid tank held exchangeable in a shut-in pressure container (2) (3), Penetrate a shut-in pressure container (2) airtightly, and an end invades in a liquid tank (3) and is prolonged to the bottom of a liquid tank (3). The other end is constituted by the duct (6) wide opened by atmospheric air. A pressurizer (4) and a decompression device (5) Use a compressor and the high-speed airstream from a compressor is supplied to a shut-in pressure container (2) at the time of liquid supply. Raise the interior of a shut-in pressure container (2) and a liquid tank (3) rather than an open air pressure, and the liquid in a liquid tank (3) is made to flow out of a nozzle (64). At the time of liquid recovery The air in a shut-in pressure container (2) is attracted by the suction effect which is made to pass an ejector (406) and produces the high-speed air from a compressor with this ejector (406). The interior of a shut-in pressure container (2) and a liquid tank (3) is made into negative pressure, and suction recovery of the liquid is carried out into a liquid tank (3) from a nozzle (64).

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## EXAMPLE

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[Example] The rise time was about 3 seconds setting a reducing valve (43) to 0.3 kgf/cm<sup>2</sup>, and supplying 800 cc ink. It was about 60 seconds from a standup to the completion of supply. The time amount which 800 cc ink recovery took was about 60 seconds. The degree of vacuum at this time was 450mmHg. The rise time was about 3 seconds. It is the rise time for supplying 800 cc ink with the conventional tube pump. It was about 5 seconds. It was about 65 seconds from a standup to the completion of supply. The time amount which 800 cc ink recovery took was about 100 seconds. The rise time was 5 seconds. However, this is the case where the tube of a tube pump is not crooked in the shape of V character, and if between a tube pump (101) and ink tanks (3) is crooked in the shape of V character, most capacity of ink supply will be lost. If a tube is crooked in the shape of V character between a tube pump (101) and a nozzle (64), most ink recovery capacity will be lost. The above-mentioned data are a comparison with the printing machine of our company.

[0038] Drawing 7 and drawing 8 are deformation of the stop means (26) of the body of a container (21) of a shut-in pressure container (2) and a lid (22). The L type metallic ornaments (500) by the side of the body of a container (21) are omitted, Itabe (501) of the L type metallic ornaments (500) by the side of a lid (22) can be scratched to the lock member (508) on the lever (502) supported pivotably on the body of a container (21) (502a), and a lid (22) is locked. The inclination slideway (504a) (501a) for making engagement easy is formed in a lock member (508) and Itabe (501). Since L type metallic ornaments (500) can be managed with one, a configuration becomes easy. It is a body (21) side of a container about L type metallic

ornaments (500). Even if it prepares a lever (502) and a lock member (508) in a lid (22) side, the same operation and effectiveness as the above are done so.

[0039] This invention of the ability to carry out to supply of liquids other than ink and a recovery system is natural. Moreover, if it is made to perform supply and recovery of a liquid as the tip of a nozzle (64) is soaked in the tank for liquid supply, rise-and-fall movement of a nozzle (64) is not necessarily required. Moreover, if the tip of a duct (6) is directly soaked in a tank, the nozzle (64) itself is ommissible. Furthermore, two sets of compressors, a \*\* and the object for suction, are prepared in pressurization and a decompression device (5) at the time of pressurization, and, of course, a separate compressor can be operated at the time of pressurization and reduced pressure. Deformation various in the range given in a claim is possible for this invention, without being limited to the configuration of the above-mentioned example.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] They are the ink supply in a corrugated paper printing machine, and the slant-face Fig. of a recovery system.

[Drawing 2] It is the front view same as the above which carried out the cross section the part.

[Drawing 3] It is the slant-face Fig. of a shut-in pressure container.

[Drawing 4] It is the important section sectional view of the stop means in the condition of having closed the lid.

[Drawing 5] A Fig. is a top view in the condition that, as for the top view of a supporter, and B Fig., the pipe fitted into the supporter.

[Drawing 6] It is the explanatory view of pressurization and a decompression device.

[Drawing 7] It is the slant-face Fig. of the shut-in pressure container equipped with the stop means of other examples.

[Drawing 8] It is the important section sectional view of the stop means in the condition of having closed the lid same as the above.

[Drawing 9] It is the front view of the printing machine using the middle type ink the conventional object for flexographic presses, and for PURISURO printing machines.

[Drawing 10] It is the slant-face Fig. of the ink supply and the recovery system using the conventional tube pump.

[Drawing 11] The tube of a tube pump same as the above is a slant-face Fig. in the condition of having been crooked in the shape of V character.

[Description of Notations]

- (1) The main roll
  - (11) Auxiliary roll
  - (2) Shut-in pressure container
  - (3) Ink tank
  - (5) Pressurization, a decompression device
  - (7) Lifting device
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## CORRECTION OR AMENDMENT

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[Procedure amendment 1]

[Document to be Amended] Specification

[Item(s) to be Amended] 0022

[Method of Amendment] Modification

[Proposed Amendment]

[0022] In the vertical plane, a nozzle (64) is crooked in the shape of L character, and the brass pipe is formed. The horizontal level (64a) of a nozzle (64) is inserted in the slot (75) of said upper piece of a support (73), the vertical section (64b) of a nozzle (64) is inserted in the slot (76) of the downward piece of a support (74), and it is supporting dismountable with the \*\*\*\*\* implement. In the example, the nozzle point section (65) which cut the synthetic-resin pipe at the tip of a nozzle (64) short, and formed it in it is attached. reverse V character-like notching (65a) gives the nozzle point section (65) at a tip -- having -- this notching (65a) -- the through tube (65b) is established up for a while. Reverse V character-like notching (65a) is to make the nozzle point section (65) easy to transform along the curved surface of a roll (1) and (11), when a nozzle (64) descends to the bottom of ink \*\*\*\*\* between a roll (1) and (11). A through tube (65b) constitutes the role which prevents that a suction force is too strong, the nozzle point section (65) is crushed flatly and ink suction falls extremely at the time of ink recovery.

[Procedure amendment 2]

[Document to be Amended] Specification

[Item(s) to be Amended] 0031

[Method of Amendment] Modification

[Proposed Amendment]

[0031] A nozzle (64) is dropped until it approaches the bottom of ink \*\*\*\*\* during a roll, at the time of ink recovery, pressurization and a decompression device (5) are switched to a suction side, and it is operated. This nozzle (64) is moved to the shaft orientations of a roll, and parallel. By the suction effect by the high-speed airstream which passes an ejector (406), the

inside of a shut-in pressure container (2) also serves as negative pressure for a short time, and carries out suction recovery of the ink of ink \*\*\*\*\* into an ink tank (3) from a nozzle (64).